



SERVIR

Regional Visualization and Monitoring System

SERVIR: A Brief Overview

West Africa Regional Adaptation Workshop

Ashutosh Limaye

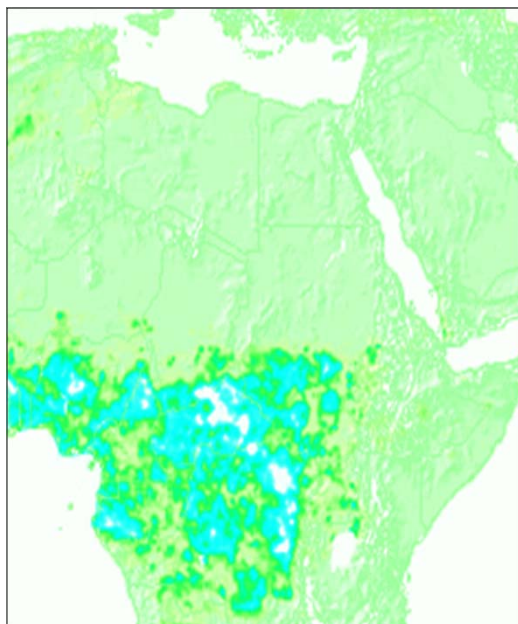
June 29, 2011



SERVIR



*Enabling the use of earth observations and models
for timely decision making to benefit society*



Flood Forecasting in Africa



Training and Capacity Building

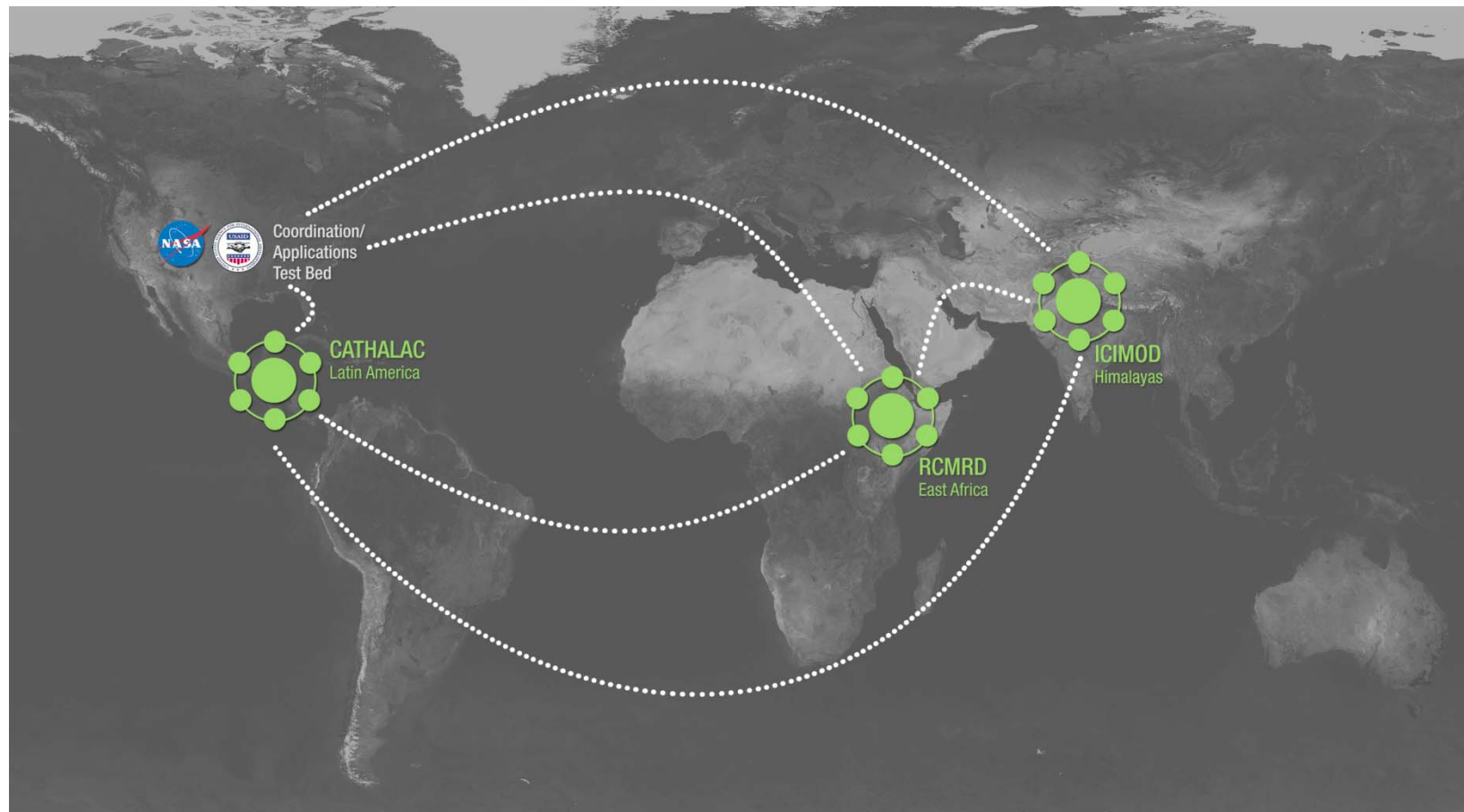


Mapping Fires in Guatemala Mexico

- **Data and Models**
- Online Maps
- **Visualizations**
- Decision Support
- **Training**
- Partnerships



SERVIR Network



SERVIR Applications

SERVIR Applications have several dependencies:

- **NASA Applied Science Program**
Agriculture, climate, disasters, biodiversity, public health & air quality, and water resources
- **GEO**
Agriculture, biodiversity, climate, disaster, ecosystems, and human health
- **USAID**
Climate change adaptation, Terrestrial carbon assessment and GEO focus areas
- **Regional Needs Assessment.**
Every science Application undertaken by SERVIR has to have a need identified.



SERVIR

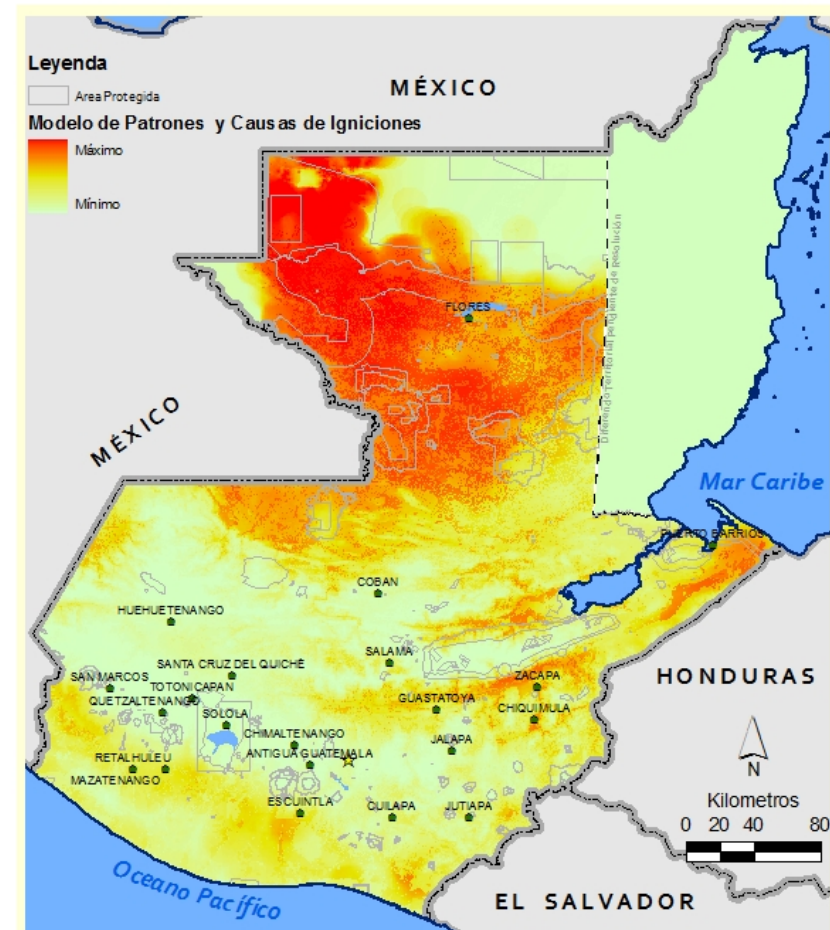
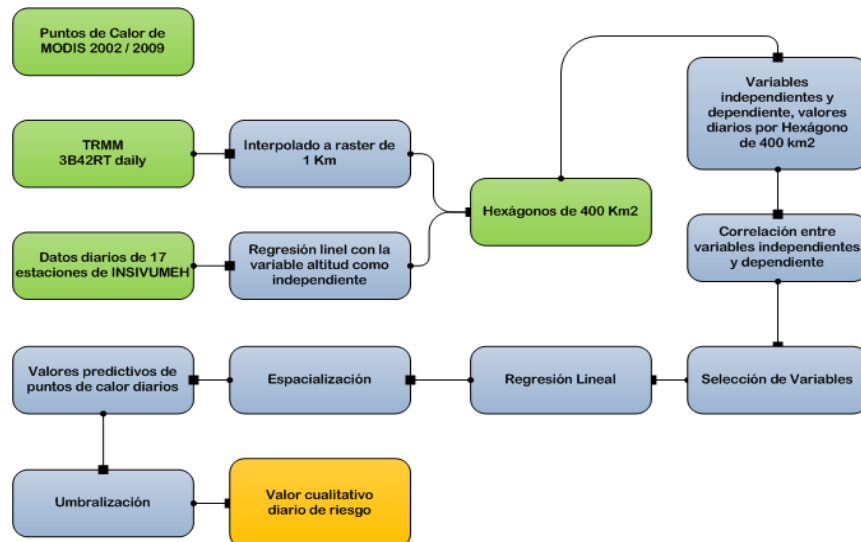
Science and Applications Plan

- **Air quality:** Particulate Matter, Ozone modeling using AQ models coupled with mesoscale atmospheric models.
- **Agriculture:** SERVIR is collaborating with FEWS NET
- **Land cover:** Land cover classifications for forest and terrestrial carbon assessments
- **Climate:** Assess adaptations necessary to mitigate impacts of climate change
- **Cryosphere:** Accurate snow water equivalent assessments to better quantify snow melt and timings
- **Disasters:** Early warning for floods, forest fires and landslides. Droughts are of significant interest
- **Health assessments:** Estimation and early warning of Rift Valley Fever, Malaria, and other vector-borne diseases using streamflow and soil moisture as proxy
- **Water:** Water quantity and quality assessments



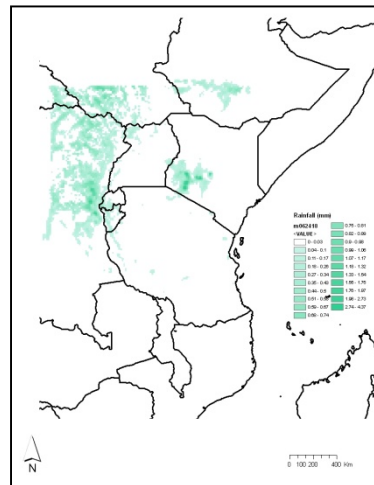
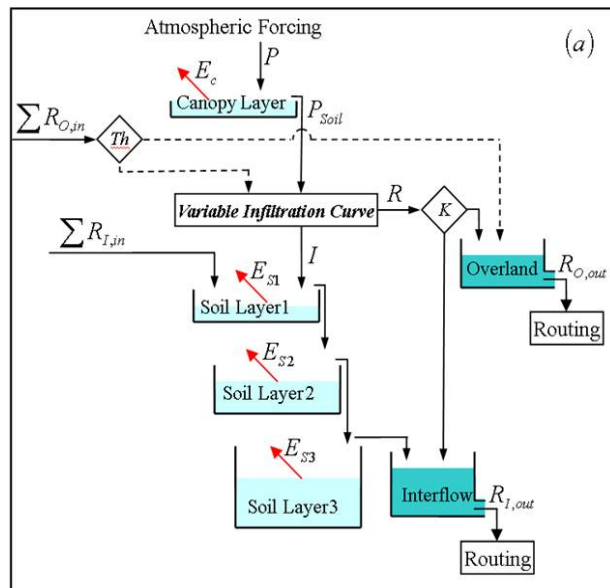
SERVIR Fire Forecasting

Fire forecasting uses MODIS Rapid Response System, a collaborative effort between GSFC and University of Maryland

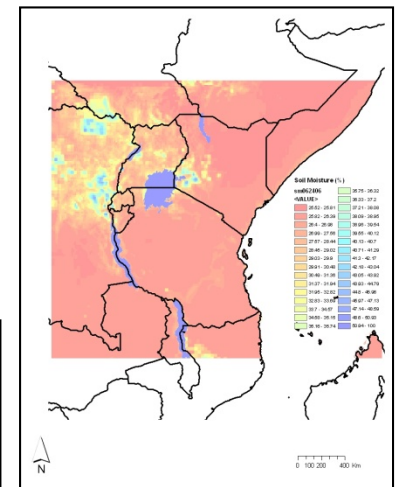
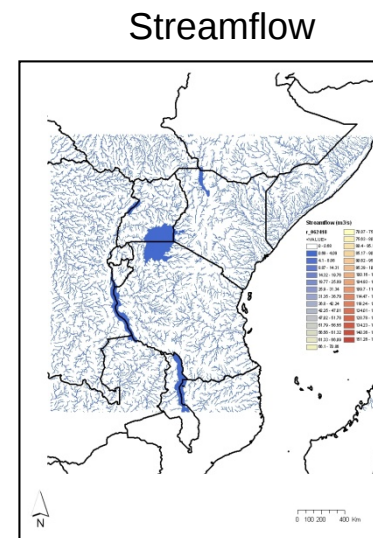


SERVIR Hydrologic Modeling

- Spatially distributed hydrologic model CREST (based on Variable Infiltration Capacity (VIC) model)
- Spatial resolution ~1km, run every 3 hours in near real time mode in the “Cloud”
- Uses near real-time satellite rainfall estimates from TRMM and forecasts from Kenya Meteorological Department (KMD) to produce soil moisture, evapotranspiration & streamflow
- Forecasted soil moisture, evapotranspiration and streamflow will enable KMD to issue early flood warning, especially in the flood prone watersheds in western Kenya.



KMD QPF

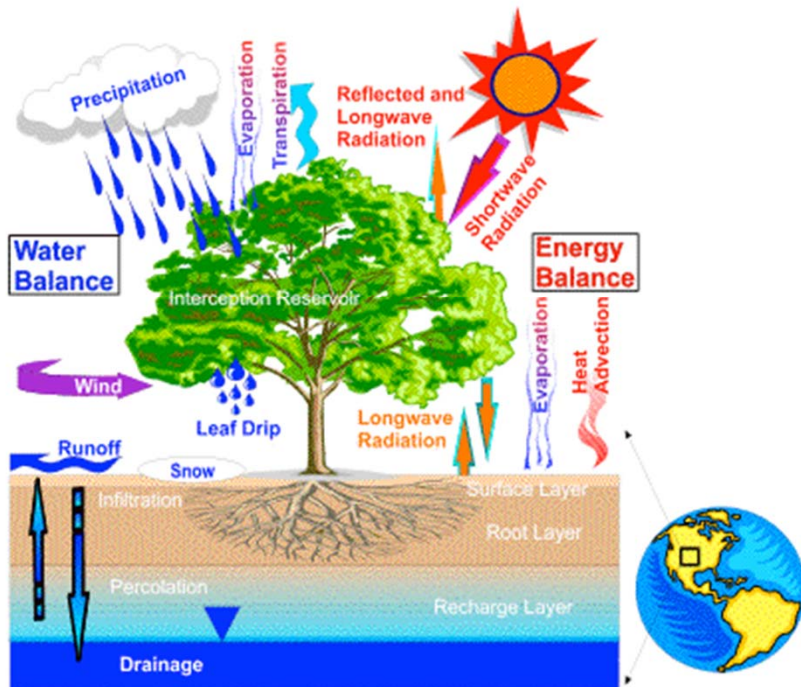


Soil Moisture



Baseline Datasets

Land Surface Modeling Concept

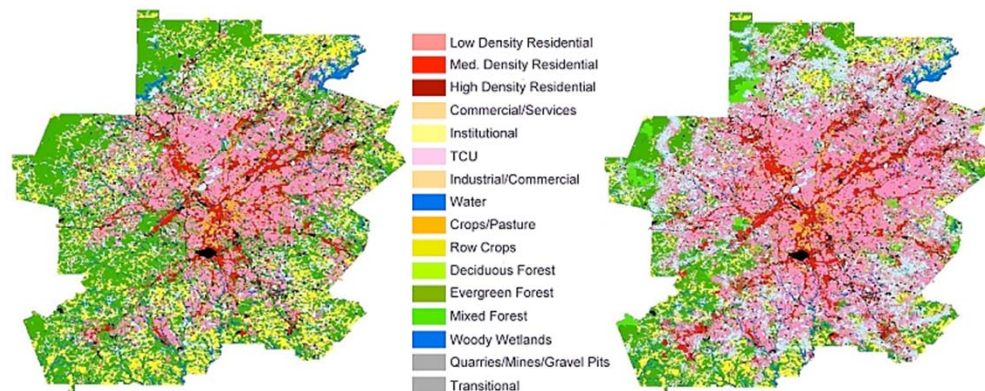


- Hydrologic observations do not exist in majority of the watersheds in the KMD domain.
- We have using a Global Reanalysis datasets (1949 – 2009), at refined scale using NASA Land Information System (LIS)
- These historic long-term data will provide the historic perspective to the near real time model estimates and to quantify hydrologic extremes including floods and drought



Land Cover and Land Cover Change

- SERVIR-East Africa is participating in a USEPA project to quantify land use change and greenhouse gas inventory in east Africa. USFS has initiated planning for Himalayan region.
- In the long term, SERVIR-East Africa would like to link land use land cover change to hydrologic assessments. These inventories, and future land cover scenarios will bring improvements in the hydrologic assessments and will also enable the end users in the region with quantitative information to better prepare for adaptation.



SERVIR Web Portal

The screenshot shows the 'East Africa - Geospatial Catalog' page. At the top is the SERVIR-East Africa header with navigation links: Home, About SERVIR, Regions, Themes, Products, News, and Community. A search bar contains the text 'SERVIRGlobal.net is in Beta testing'. Below the header, the page title is 'East Africa - Geospatial Catalog'. The main content area is divided into two columns. The left column, titled 'Geospatial Catalog Advanced Search Options', includes a search bar with 'rft', a 'Search' button, and filters for 'Topic', 'Time', and 'Location'. The right column, titled 'Geospatial Catalog Results (2)', displays two search results. The first result is 'Rift Valley fever in Africa and Middle East', which includes a brief description and a map showing the distribution of the disease. The second result is 'Rift Valley fever in Sub-Saharan Africa', which includes a more detailed description of the disease's spread and a map showing the distribution of the disease. The bottom of the page features logos for USAID, NASA, ICIMOD, and the Group on Earth Observations, along with a 'Connectivity for SERVIR' logo and a 'Privacy and Terms of Use' link.

SERVIR-EAST AFRICA

Search SERVIR-East Africa
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SERVIR Home | About SERVIR | Regions | Themes | Products | News | Community

SERVIR-East Africa > Products > Geospatial Catalog

East Africa - Geospatial Catalog

SERVIR's Geospatial Catalogs provide interfaces to discovery services you can use to access geospatial data and associated information products and services. Search here for items from the **East Africa** catalog. If you are looking for items from another SERVIR Region, please navigate to the starting page for those catalogs ([Mesoamerica](#), [Himalaya](#)).

Geospatial Catalog Advanced Search Options

Specify 1 or more options below

Topic

Search Topic(s)

Apply To: ☒ Title | ☐ Abstract | ☐ Keyword

Time

Select Date Range to limit search results by date

☐ Anytime

From:

To:

Location

Click on map once and slide cursor to draw a search box. Click again to indicate that drawing is complete. Manually edit coordinates specified below, if desired. Only search results that overlap with this selected area will be included.



Map data ©2011 Geoconne Consulting - Terms of Use

Latitude: 0.0 Longitude: 0.0

Geographic Search Boundary

North
West East
South

Geospatial Catalog Results (2)

Page 1 of 1 Displaying 1 - 2 of 2

Rift Valley fever in Africa and Middle East

Rift Valley fever is an OIE list A disease. The map shows the last reported outbreaks of Rift Valley fever in different countries of Africa and Middle East.

Descriptive keywords: Rift Valley fever (theme).
outbreak, Africa and Middle East (theme).
Africa (place).

Record Date (2/22/2011 8:36:05 AM)

Rift Valley fever in Sub-Saharan Africa

The map shows potential suitable areas for Rift Valley fever in Sub-Saharan Africa. The map is the result of a spatial analysis combining four geographical layers, namely the Landcover classification, slopes, closed forest and the Digital Elevation Model. A suitability indicator was defined according to the biology of the vector of Rift Valley fever virus and the presence of susceptible hosts. This preliminary work should be further validated using ground-truth data (e.g. results of serological survey and entomological studies) and refined accordingly to restrict the geographical extension of high risk areas which might have been overestimated. The map is restricted to Sub-Saharan African and the Southern part of Middle East where the virus is known to be potentially present according to scientific literature and reported outbreaks. It differs from the map entitled "Rift Valley fever risk mapping" where areas of North Africa and the Middle East (e.g. Iraq) have been included into the m

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Page 1 of 1 Displaying 1 - 2 of 2

USAID NASA ICIMOD GEO GROUP ON EARTH OBSERVATIONS

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Mesoamerica provided by
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The screenshot shows the 'East Africa - Interactive Web Maps' page. At the top is the SERVIR-East Africa header with navigation links: Home, About SERVIR, Regions, Themes, Products, News, and Community. A search bar contains the text 'SERVIRGlobal.net is in Beta testing'. Below the header, the page title is 'East Africa - Interactive Web Maps'. The main content area is divided into two columns. The left column, titled 'Catalog', lists various data layers: Aggregated GDACS, Earthquakes, Fires, Floods, GOACS - Flood B, GOACS - Flood D, Storms, Volcanoes, Ecosystems, Health, Infrastructure, Weather, and TRMM Rainfall. The right column, titled 'Layers Currently in Map', shows a map of East Africa with various data layers overlaid. The 'Layer Information' panel on the right provides details for the 'TRMM Rainfall' layer, including its name, type, provider name, and provider URL. The bottom of the page features logos for USAID, NASA, ICIMOD, and the Group on Earth Observations, along with a 'Connectivity for SERVIR' logo and a 'Privacy and Terms of Use' link.

SERVIR-EAST AFRICA

Search SERVIR-East Africa
SERVIRGlobal.net is in Beta testing

SERVIR Home | About SERVIR | Regions | Themes | Products | News | Community

SERVIR-East Africa > Products > Interactive Web Maps

East Africa - Interactive Web Maps

The SERVIR Web Mapper allows you to access and display data or functionality from several external sources to create a new service. Using the Web Mapper interface, you can choose specific data sets and information products by type and date, display them on a base map, and further manipulate them for analysis.

Please note: If a layer in the Interactive Web Map will not load properly, then it's likely that there are service issues with the Web Map Services (WMS) on the third-party provider's end. We are working on ways to improve our ability to detect issues with our third-party providers' services as they arise. Please report any issues [here](#). Thank you for your assistance!

— The SERVIR web team

Catalog

☐ Aggregated GDACS A

☐ Earthquakes

☐ Fires

☒ Floods

☐ GOACS - Flood B

☐ GOACS - Flood D

☐ Storms

☐ Volcanoes

☐ Ecosystems

☐ Health

☐ Infrastructure

☒ Weather

☒ TRMM Rainfall

Layers Currently in Map

☒ Rainfall, Latest 3-Hour Estim

☒ Water Requirements

Layer Information

Metadata | Display Config | Legend

Layer Name: TRMM Rainfall

Layer Type:

Provider name:

Provider url:

TRMM Rainfall

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SERVIR Web Portal

 **SERVIR**BETA.NET

INSTRUCTIONS ▾

Clip, Zip & Ship

Download SERVIR datasets by following the steps below.

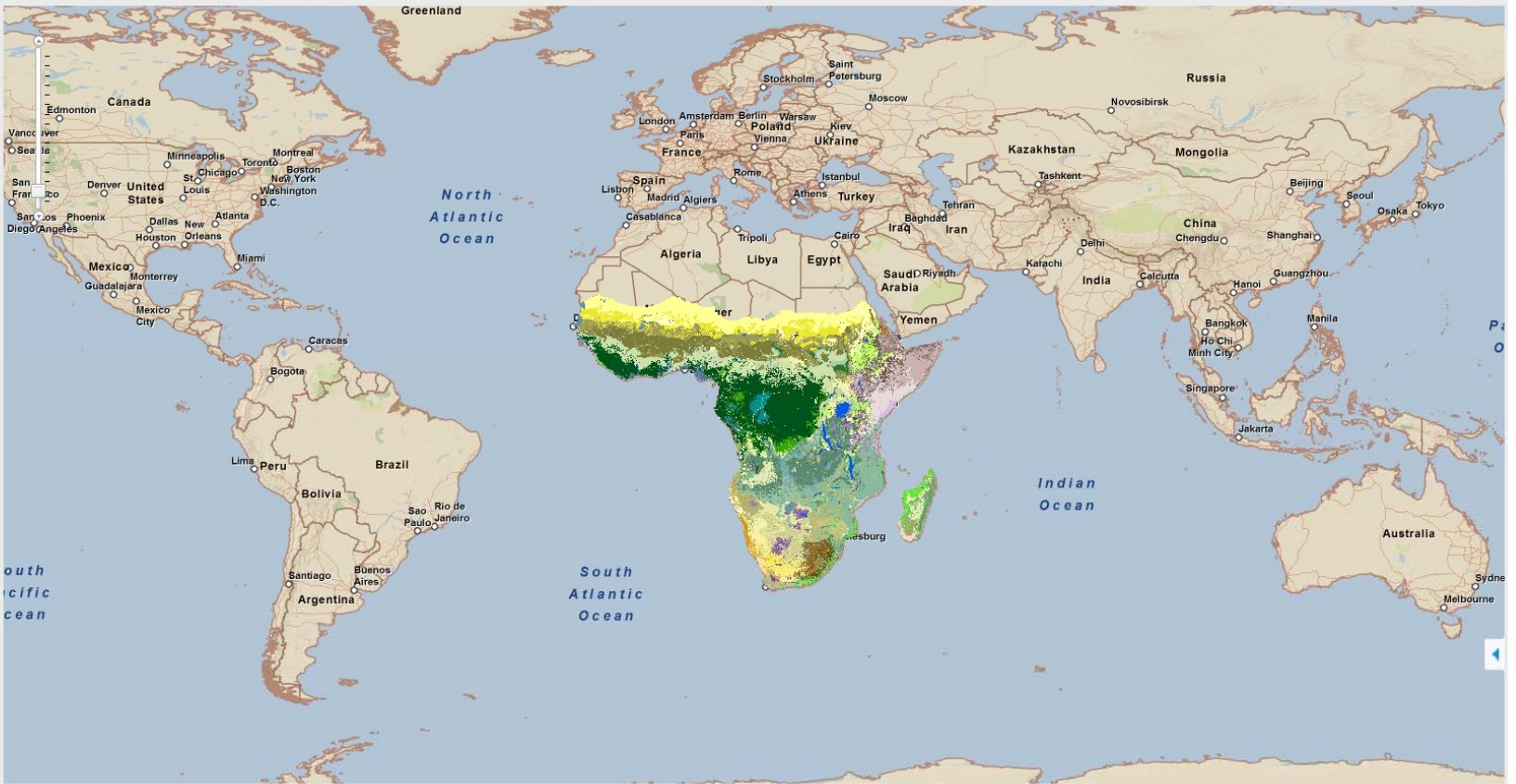
STEP 1: Enter your e-mail address:

STEP 2: Click the button to activate clipping mode.

START DRAWING ON MAP

Map Contents

- ☒ **USGS Ecosystems**
 - ☒ Terrestrial Ecosystems
 - ☐ Surficial Lithology
 - ☐ Isobioclimates
 - ☐ Land Surface Forms
 - ☐ Topo Moisture Potential
- ☒ **Agriculture**
 - ☐ Soil Types
 - ☐ Harvest Plus Farming Systems
 - ☐ Dixon Farming Systems
 - ☐ FAO Soils
 - ☐ FAO Soil Fertility
 - ☐ Pasture
- ☒ **Biodiversity**
 - ☐ World Protected Areas
- ☒ **Climate**
 - ☐ Average Precipitation
 - ☐ Average Temperature
- ☒ **Health**
 - ☐ Health Poverty Index
 - ☐ Proportion of underweight children < 5 years
- ☒ **Ecosystems**
 - ☐ Forest Cover
 - ☐ Land Use
- ☒ **Infrastructure**
 - ☐ OSM_PrimaryRoads
 - ☐ OSM_Roads



In a Nutshell...

- SERVIR is a joint USAID – NASA effort, which uses remotely sensed data and products for societal benefit.
- SERVIR currently has three hubs, in Central America, East Africa and Himalaya.
- Science Applications, IT infrastructure and capacity building is central to SERVIR efforts.
- Collaborations are key. SERVIR is continuing to develop strong, working collaborations with government entities in the region, such as KMD.

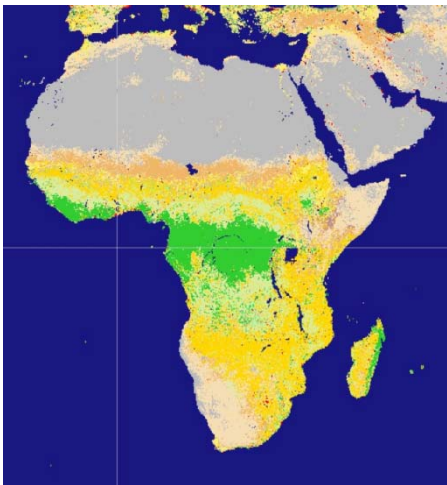


Backup



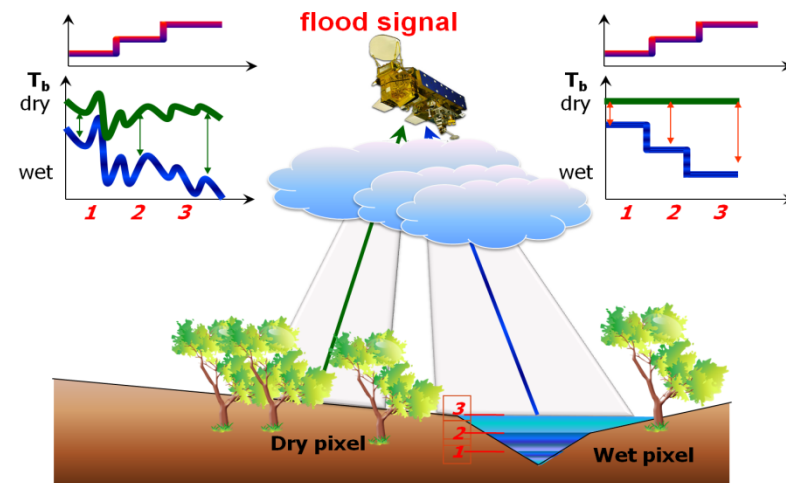
Land Cover and Land Cover Change

- SERVIR is putting together a plan to develop three temporal slices of land cover maps over a region in east Africa using medium resolution (30m Landsat multi-spectral imagery)
- Plan includes training ground sampling crew for collection of validation data and training the in-country technicians in land cover classification and assimilation of validation data
- SERVIR will perform quality assessment and accuracy assessment quantification
- This assessment will also enable linking and quantifying changes to the hydrologic regime



Assimilating Remotely Sensed Streamflow in Modeled Estimates

- Later this year, we plan to assimilate microwave-based streamflow estimates (TRMM and AMSR-E) into the CREST model.
- Spatial resolution of the microwave products will be coarser, but will provide a temporal signal of statistical significance, which will result in improved initializations for the forecast runs.
- Additional data and methods for assimilation are valuable, and will provide improved forecasts.



Flood Potential



SERVIR @ CATHALAC

City of Knowledge, Panama

Inaugurated on February 3, 2005



SERVIR-Africa @ RCMRD

Nairobi, Kenya



Inaugurated on
November 21, 2008



Daniel
Database Mgt
Specialist

Erick
Project Lead
at
RCMRD



Catherine
Remote
Sensing
Analyst

Tesfaye
Senior Scientist



Lawrence
RCMRD
Database
Manager



Wafula
IT System
Administrator



John
Web services
Specialist



SERVIR-Himalaya @ ICIMOD

Kathmandu, Nepal



Inaugurated on
October 5, 2010

